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(71) Applicant *(for all designated States except US)*: **NEO-MORGAN LABORATORY INCORPORATED** [JP/JP]; 1-1-1, Uchisaiwaicho, Chiyoda-ku, Tokyo 1000011 (JP).

(71) Applicant and
(72) Inventor: **FURUSAWA, Mitsuru** [—/JP]; 605 Nishikasaipakufamiria, 6-6-8, Nishikasai, Edogawa-ku, Tokyo 1340088 (JP).

(74) Agents: **YAMAMOTO, Shusaku** et al.; Fifteenth Floor, Crystal Tower, 1-2-27, Shiromi, Chuo-ku, Osaka-shi, Osaka 5406015 (JP).

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Published:
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(88) Date of publication of the international search report: 16 December 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND SYSTEM FOR RAPIDLY CONFERRING A DESIRED TRAIT TO AN ORGANISM

(57) Abstract: A method is provided for regulating the conversion rate of a hereditary trait of a cell, comprising the step of regulating the error-prone frequency of gene replication of the cell. A method is provided for producing a cell having a regulated hereditary trait, comprising the step of (a) regulating an error-prone frequency of gene replication of the cell, and (b) reproducing the resultant cell. A method is provided for producing an organism having a regulated hereditary trait, comprising the steps of (a) regulating the error-prone frequency of gene replication of the organism, and (b) reproducing the resultant organism.

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INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/10 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, BIOSIS, WPI Data, Sequence Search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MORRISON ALAN ET AL: "The 3'-to-5' exonucleases of both DNA polymerases delta and epsilon participate in correcting errors of DNA replication in Saccharomyces cerevisiae" MOLECULAR AND GENERAL GENETICS, vol. 242, no. 3, 1994, pages 289-296, XP001183125 ISSN: 0026-8925 cited in the application abstract page 289, column 2, last paragraph page 290, column 1 page 290, column 2, last paragraph	1-31, 33-38, 42-76, 78-97, 99-108, 110-124
Y		1-114, 117-124

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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Date of the actual completion of the international search	Date of mailing of the international search report
30 September 2004	13/10/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Schmitt, C

Form PCT/ISA/210 (second sheet) (January 2004)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	-& MORRISON A ET AL: "PATHWAY CORRECTING DNA REPLICATION ERRORS IN SACCHAROMYCES CEREVISIAE" EMBO JOURNAL, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 12, no. 4, 1993, pages 1467-1473, XP001145623 ISSN: 0261-4189 *whole document, especially section "construction of yeast strains" in Materials and methods*	
X	EP 1 054 057 A (JAPAN SCIENCE & TECH CORP) 22 November 2000 (2000-11-22) cited in the application	1-27,30, 33-38, 41-72, 75, 78-97, 99-101, 103,104, 106, 110-124
	paragraphs '0009! - '0012!, '0014!, '0015!, '0029!, '0031!, '0033!, '0065! claim 10	
Y		1-114, 117-124
X	GOLDSBY ROBERT E ET AL: "High incidence of epithelial cancers in mice deficient for DNA polymerase delta proofreading." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA. 26 NOV 2002, vol. 99, no. 24, 26 November 2002 (2002-11-26), pages 15560-15565, XP002296102 ISSN: 0027-8424 whole document, especially sections "Increased tumor incidence in Pold1D400A/D400A mice" and "Increased spontaneous mutation rate of cultured Pold1D400A/D400A cells" of Results	1-108, 110-124
Y		1-114, 117-124

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INTERNATIONAL SEARCH REPORT

International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BARNES M H ET AL: "Localization of the exonuclease and polymerase domains of Bacillus subtilis DNA polymerase III." GENE. 1 FEB 1992, vol. 111, no. 1, 1 February 1992 (1992-02-01), pages 43-49, XP002296528 ISSN: 0378-1119 abstract page 45, column 2, last paragraph - page 46, column 1, paragraph 1 page 46, column 2, paragraph 1 table 1 section "(1) selective suppression of BsPolIII Exo activity" of Results and discussion	1-28,30, 33-38, 41-73, 75, 78-83, 86-114, 117-124
Y		1-114, 117-124
Y	FURUSAWA MITSURU ET AL: "Asymmetrical DNA replication promotes evolution: Disparity theory of evolution" GENETICA (DORDRECHT), vol. 102-103, no. 0, 1998, pages 333-347, XP009036173 ISSN: 0016-6707 whole document, especially section "Shortening evolution time"	1-114, 117-124
Y	AOKI K ET AL: "Promotion of evolution by intracellular coexistence of mutator and normal DNA polymerases." JOURNAL OF THEORETICAL BIOLOGY. 21 MAR 2001, vol. 209, no. 2, 21 March 2001 (2001-03-21), pages 213-222, XP002295420 ISSN: 0022-5193 cited in the application the whole document	1-114, 117-124

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Although independent claims 1, 45, 90, 95, 97, 99, 115 and 116 relate to methods for regulating a conversion rate of a hereditary trait of a cell, producing a cell having a regulated hereditary trait, producing an organism having a regulated hereditary trait, producing a nucleic acid molecule comprising changing an error-prone frequency of a gene replication of an organism, producing a metabolite of an organism comprising changing an error-prone frequency of gene replication of an organism, testing a drug comprising using a cell and testing a drug comprising using an organism, and thus, comprise a step of treatment by surgery practised on the human/animal body, the search has been carried out without taking this step into account.
The same applies to claims 2-44 and 46-89 which are dependent on claims 1 and 45, respectively.

The same applies also to independent claim 123 which relates to the use of at least two kinds of polymerases for regulating a conversion rate of an hereditary trait of an organism and is thus regarded as relating to a method of treatment by therapy practised on the human or animal body.

Continuation of Box II.1

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/JP2004/004378

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1054057 A	22-11-2000	EP 1054057 A1	22-11-2000
		WO 0028015 A1	18-05-2000
		US 2003124725 A1	03-07-2003

INTERNATIONAL SEARCH REPORT

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

see FURTHER INFORMATION sheet PCT/ISA/210

2. [ ] Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.